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PRESENTATION TO THE  
THE SIXTEENTH ANNUAL  
DEPARTMENT OF DEFENSE COST ANALYSIS SYMPOSIUM

TITLE: PROGRAM INFORMATION DIGEST FOR THE PROFESSIONAL DESIGNATION  
IN COST ANALYSIS AND PRICE ANALYSIS

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## PROFESSIONAL DESIGNATION IN COST ANALYSIS AND PRICE ANALYSIS

### I. Purpose.

The Professional Designation in Cost Analysis and Price Analysis is a program offered by the Air Force Institute of Technology (AFIT), in conjunction with the Institute of Cost Analysis, to recognize those personnel in Cost Analysis/Cost Estimation, Price Analysis/Price Estimating, Program Analysis, Budget Analysis, Management Analysis, Financial Analysis, and related fields who advance their knowledge and skills through continuing professional education and who have successfully completed courses teaching the approved techniques and methods of cost analysis.

### II. Eligibility.

All personnel who apply for participation in the program and successfully complete the course requirements (grade C or better) are eligible to be awarded the designation. The program is offered at no cost to the applicant.

### III. Application.

Complete the attached application for candidacy. Enter the courses you have completed and other requested information, and attach a copy of the course completion certificate. When you have completed four courses, including two core courses, forward the application for candidacy and supporting documentation to the School of Systems and Logistics (AFIT/LSPA), Wright-Patterson AFB, OH 45433. Additional application forms may be obtained from the same address.

### IV. Requirements.

You must successfully complete eight courses in the Cost Analysis and Price Analysis field, four core courses and four elective courses. The four core courses may be selected from six continuing education courses offered at AFIT, at least two of which must be completed in AFIT residence or on-site classes. The four elective courses may be selected from the four groups under Section VII below. As will be noted, one course is required from each group of courses with two of the four courses completed thru AFIT residence or on-site offerings. Equivalent courses from other accredited schools and universities can count toward the requirements up to a maximum of four courses. Equivalence will be determined by an AFIT/LSP faculty panel. In general, these courses should be listed in past or current editions of DOD 5010.16C, "Defense Management Education and Training (DMET)", or other accredited school and university catalogues. Courses must be at least a week in length. Acceptable means of completion of courses include resident, on-site, seminar, correspondence, and equivalence tests when available.

V. Recognition.

After successful completion of the program requirements, you will be awarded the Profession Designation in Cost Analysis and Price Analysis. You will receive a certificate bearing the signature of the Dean of the School of Systems and Logistics and the President of the Board of Directors of the Institute of Cost Analysis. For DOD personnel, the certificate will be sent to your commander by the Dean for presentation.

VI. Core Courses.

A. DMET

Courses determined to be basic to the cost analysis and price analysis fields, i.e., courses which provide information and develop skills necessary for analysis of proposed systems or contractor proposals.

QMT 170, Principles of Contract Pricing

QMT 180, Learning Curve Analysis

QMT 345, Quantitative Techniques for Cost and Price Analysis

QMT 540, Advanced Procurement Pricing

QMT 550, Advanced Quantitative Methods for Cost Analysis

QMT 551, Advanced Cost and Economic Analysis

QMT 170, Principles of Contract Pricing: This three-week course provides a basic understanding of cost and price analysis policies, procedures, and techniques. As such it provides the foundation for the program. The course includes an examination of the environment in which cost and price analysis takes place, sources of data, tools and techniques, methods for analyzing direct and indirect costs, etc. Specific techniques introduced include graphing (arithmetic and log-log), Unit Learning Curve formulation, forecasting using graphs, and indices. A working knowledge of mathematics through basic linear relationships is assumed. The course presently carries two quarter hours of lower level undergraduate credit.

QMT 345, Quantitative Techniques for Cost and Price Analysis: This four-week course develops the student's capability to use fundamental quantitative methods in analysis. The course includes studies of probability, descriptive and inferential statistics, sampling, learning

curves (Unit and Cumulative Average formulations), index numbers, time series forecasting and coverage of two variable linear regression analysis. Emphasis is placed on the application of techniques in comprehensive problems and cases. This course introduces the use of computer terminals and selected typical programs. The comptroller integrating case study deals with the development of a cost estimate for a proposed new system. The course carries five quarter hours of upper level undergraduate credit.

QMT 540, Advanced Procurement Pricing: This course is designed to develop the student's capability in advanced pricing techniques used in the estimation and analysis of costs in large procurements.

QMT 550, Advanced Quantitative Methods for Cost Analysis: This four-week course provides an in-depth study of regression analysis as applied in systems cost estimating and analysis. The course includes introduction of matrices, non-linear relationships, logarithms, curvilinear functions, linear and non-linear regression of two variable and multivariable relationships, net scatter diagrams, and selected special topics in cost analysis. An individual comprehensive problem at the end of the course enables the student to integrate the various methods taught during the course. Time shared computer terminals and typical programs are used extensively. The course carries three quarter hours of graduate credit.

QMT 551, Advanced Cost and Economic Analysis: Also four weeks long, this course provides extensive application of advanced techniques. This is the final course in the cost analysis education program. It provides the experienced analyst with the mathematical and statistical tools necessary to develop cost estimates for weapons systems. Items covered include advanced regression techniques, treatment of uncertainty in cost analysis, economic analysis, simultaneous estimation techniques, use of models and estimation of operating and support cost. This course also carries three quarter hours of graduate credit.

QMT 170 is offered in residence (i.e. at WPAFB) and on-site, by seminar, and by correspondence (ECI 6610). You can also satisfy the requirement by passing an equivalency test administered by the Army Logistics Management Center (ALMC). Contact your education office for procedures and addresses. QMT 180 is offered in residence and on-site, QMT 345 is offered in residence and on-site, or you can again satisfy the requirement by passing an equivalency test. QMT 540, QMT 550, and QMT 551 are presently offered in residence only. The Defense Cost and Price Analysis Course (PN) offered by the Naval Materiel Command may be substituted for QMT 170. The Cost Analysis for Decision Making course offered by the Army Logistics Management Center can be substituted for QMT 345.

**B. Other Accredited Schools and Universities.**

Up to two core course equivalents from other accredited schools

and universities may be accepted in lieu of the above core requirements, upon approval by the AFIT faculty panel.

VII. Elective Courses.

A. DMET

Courses determined to be closely related to the cost analysis field, i.e., courses which provide information and develop skills desired for cost analysis are:

Management Courses (1 Required)

QMT 353	Introduction to Life Cycle Cost Management
70-45	Military Comptroliership (USAIR)
80-F12	Management of Defense Contract Acquisition Contracts (ADV) (ALMC)
LMDC-501	Professional Military Comptroller Course (LMDC)
PPM 304	Advanced Contract Administration

Quantitative Methods/Analysis Courses (1 Required)

FA-F10	Economic Analysis for Decision Making (AMETA)
ALMC-CB	Cost Analysis for Decision Making (ALMC)
QMT 550	Advanced Quantitative Methods for Cost Analysis (If not counted as a Core Course)
ALMC-CC	Cost Estimating for Engineers (ALMC)
QMT 551	Advanced Cost and Economic Analysis (If not counted as a Core Course)

Accounting/Cost Control Courses (1 Required)

QMT 355	Contractor Overhead Monitorship
SYS 360	Evaluation of Cost Schedule Control System Criteria
SYS 361	Surveillance of Cost Schedule Control Systems Criteria

Programming Courses (1 Required)

QMT 365	Computer Programming - BASIC
QMT 375	Computer Programming - FORTRAN

Other courses will be considered if they fall within one of the above categories and are justified as specified in VII B.

**B. Other Accredited Schools and Universities.**

Courses completed in other accredited schools/universities in fields allied to cost analysis or price analysis will be considered in partial satisfaction of PD elective course requirements. This is accomplished by submitting a formal request for review of credentials in support of your claim. A special AFIT Faculty Panel will review the request and notify you of its findings. As a minimum, the request should include:

1. An explanation of why the course should be considered in the first instance, i.e. how it relates to work done by cost analysts and price analysts.
2. A course syllabus or catalogue description

**VIII. Professional Designation and Professionalism**

Professional Designation indicates not only that you are interested in advancing your skills and knowledge in the area, but that you have successfully completed courses which introduce and develop the quantitative techniques and cost management concepts basic to your career field. The effort you take to achieve this designation will enhance your work and your value as an employee. The award recognizes your efforts, enhances your credibility as a professional, and provides a visible symbol of your accomplishments.

**IX. How Should I Start?**

An application form and documentation sheet is attached. You should enter the courses you have completed along with other requested information and attach a copy of the course certificate(s). When you have completed four courses, forward the application for candidacy and supporting documentation to AFIT/LSP, Wright-Patterson AFB, Ohio 45433. If you prefer you may hold the application until all courses are completed and then submit.

ROLAND D. KANKEY  
Assistant Professor of Quantitative Management  
Chairman, PD in Cost Analysis and Price Analysis  
(AUTOVON: 785-6280) (Commercial: 513-255-6280)

APPLICATION FOR CANDIDACY  
PROFESSIONAL DESIGNATION IN COST ANALYSIS AND PRICE ANALYSIS  
Offered By  
the Air Force Institute of Technology  
in conjunction with  
the Institute of Cost Analysis

Request that I be enrolled in the program for award of the Professional Designation in Cost Analysis and Price Analysis.

I. PERSONAL DATA

NAME: \_\_\_\_\_  
Last \_\_\_\_\_ First \_\_\_\_\_ Initial \_\_\_\_\_  
Rank or Grade \_\_\_\_\_ Military Specialty (If applicable) \_\_\_\_\_  
Present Position Title \_\_\_\_\_  
Official Mailing Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Telephone Number (AUTOVON) \_\_\_\_\_ (Commercial) \_\_\_\_\_

II. EDUCATIONAL HISTORY (Circle last year completed)

High School: 10 11 12 College: 1 2 3 4 5 6

Degree \_\_\_\_\_ Major field of study \_\_\_\_\_

III. EMPLOYMENT DATA (OPTIONAL)

Supervisor's Name \_\_\_\_\_

Rank or Grade \_\_\_\_\_

Official Address \_\_\_\_\_

IV. SUPPORTING EVIDENCE

On the reverse side, I have listed the courses already completed toward the Designation and I have attached evidence of completion for each course listed. (Course completion certificate, transcript, or other evidence of completion.) I authorize the AFIT Registrar to release my course grades to the Program Chairman.

Date \_\_\_\_\_ Applicant's Signature \_\_\_\_\_

August 1981

IV. SUPPORTING EVIDENCE (Continued)

Course Title		
School	Date	Grade
Course Title		
School	Date	Grade
Course Title		
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## GRADUATE PROGRAM SYSTEMS MANAGEMENT

### THE SCHOOL

The School of Systems and Logistics is the Air Force's center for education and research programs concerned with the management of a variety of defense systems. In particular, the School conducts programs directed at the study of systems developed to support Air Force logistics, research and development, and engineering management goals and objectives. In this role, the School offers both graduates and continuing education programs designed to meet the changing needs of DOD managers in a variety of support fields.

The School of Systems and Logistics is located in Building 641, Area B, Wright-Patterson AFB, Dayton, Ohio. This academic facility, dedicated in 1977, provides both students and faculty with an outstanding environment in which to work. The building can accommodate approximately 700 students and some 150 faculty and staff personnel. Included in its 80,000 square foot area are 30 classrooms, 13 seminar rooms, a large student study area with 48 individual carrels, a branch library designed to support study and research, computer operations facilities having both time-sharing and batch access capability, and administrative offices for assigned faculty and staff personnel.

### THE DEGREE

In accordance with Public Law 733 of the 83rd Congress, the Commander, Air University, is authorized to confer degrees upon persons who meet all requirements for those degrees as established by AFIT. The Institute

is accredited by the North Central Association of Colleges and Schools.

The Graduate Program in Systems Management leads to the Master of Science degree.

#### THE PROGRAM

The primary purpose of the graduate programs offered by the School of Systems and Logistics is to provide selected graduate military and civilian managers with an educational experience designed to enhance their ability to effectively analyze, design, and manage complex defense systems concerned with meeting USAF and DOD needs in the areas of logistics management, systems management and engineering management. Each of the graduate programs conducted by the School is designed to help students accomplish the following specific educational objectives:

1. Apply systems theory to the analysis of complex phenomena, problems, and decision situations;
2. Conduct scientific research in solving problems and making decisions concerned with the management of complex systems;
3. Apply fundamental concepts and techniques of descriptive and inferential statistics to problem analysis and decision making under conditions of uncertainty and risk;
4. Use fundamental management science (operations research) concepts and techniques to improve problem analysis and decision-making effectiveness;
5. Communicate effectively, both orally and in writing;
6. Apply basic concepts and techniques of organization theory and behavior relevant to managing complex organizations;

7. Apply management information systems concepts to effectively support the decision-making structure and processes in a complex organization;

8. Apply basic concepts and techniques of economic analysis, financial management, and accounting in acquiring and controlling the financial resources necessary to support the operations of a complex organization;

9. Describe and, where appropriate, apply fundamental concepts and techniques for acquiring/providing products or services by contract;

10. Evaluate systems for the effective and efficient production and distribution of those goods and services an organization provides to its customers; and

11. Integrate and apply concepts and techniques acquired in all of the course work included in a particular curriculum to the analysis and development of organizational policy.

The Graduate Systems Management Program of the Air Force Institute of Technology is a 15 month master's program which focuses on preparation for cost analysis, R&D, engineering, and other technical management in the Air Force and the Department of Defense. Curricular emphasis in the program addresses fundamentals and theory from four basic disciplines.

1. Accounting/Financial Management - Study in this area focuses on the measurement and reporting of financial information, the accumulation of cost information for discrete programs and products, and federal budgeting and financial management concepts and requirements.

2. Economics - Study in this area focuses on evaluation of the impact of public and private decision making on resource allocation, optimization subject to constraints, and efficiency criteria for input and output markets.

3. Statistics and Operations Research - Study in this area focuses on statistical techniques for summarizing and describing data; the use of statistics to communicate data and to make decisions; and use of the methodology (models and model formulation) and optimization techniques of operations research to assist with problem solving.

4. Management Theory and Practices - Study in this area focuses on organization theory, management thought, organization/management research, and organizational behavior. Also included in this area is a study of systems and project theory.

Later in the program students are provided opportunities to do elective study in fields of interest. Students are required to apply the knowledge gained in the basic disciplines and their elective studies by means of an independent study. Normally this independent research effort addresses a current Air Force/DOD issue.

The intent of the Graduate Systems Management Program is to present the concepts, theories and methodologies of the areas studied so that its graduates are prepared to operate within diverse environments; adapt to changing conditions; analyze complex, dynamic problems; and make informed decisions. It is not intended that students be trained in existing procedural requirements. This is viewed as the function of professional continuing education.

Some of the identifiable areas of specialty for student choice include R&D management, system acquisition management, cost analysis, behavioral science, and quantitative management techniques. Graduates are assigned in many Air Force Specialty Codes into positions requiring the management of people and resources in a technical environment, e.g., engineering team leaders, project managers, computer systems management officers, communications systems management officers, procurement officers, cost analysts, etc.

## THE CURRICULUM

The graduate curriculum for the Systems Management major consists of 19 integrated core and elective courses, plus 12 hours of thesis study. The core courses provide a wide variety of quantitative and qualitative information concerned with the many facets of quantitative analysis and systems management techniques. Electives are designed to broaden the students horizons and/or provide more in-depth information in the specific area of interest. The thesis must address a real-world problem in the military area. Many thesis topics are provided by DOD/USAF agencies interested in sponsoring student research in areas of practical concern. The curriculum for the Systems Management major is listed below in the sequence offered.

### Review Term

Elements of Financial and Cost Accounting

Matrix Algebra/Calculus Review

### Qtr I (Summer)

Research and Technical Writing

FORTRAN Programming

Managerial Statistics I

Management and Behavior in Organizations

### Qtr II (Fall)

Managerial Economics I

Managerial Accounting

Operations Research I

Applied Data Analysis for Systems Managers

Qtr III (Winter)

Managerial Economics II

Operations Research II

Elective

Elective

Thesis Proposal

Qtr IV (Spring)

Production Management

Federal Financial Management

Management Information Systems

Independent Study (Thesis)

Short Term

Independent Study (Thesis)

Qtr V (Summer)

Independent Study (Thesis)

Seminar in Systems Management/R&D Management/Cost Analysis

Elective

**STUDENTS**

Students are accepted in the graduate programs of the School of Systems and Logistics in the grades of lieutenant to lieutenant colonel, or civilians of comparable rank. Typically, students in the Graduate Systems Management Program are senior captains and junior majors and civilian equivalents. Most students are USAF military officers or DOD civilians; however, the student body also includes officers from the sister services and foreign officers. The students have experience in a variety of career

fields, including aircraft, missile, engineering, scientific, contracting and acquisition, cost analysis, computer systems and system program management. Upon graduation, the students may be assigned to a wide variety of directed duty assignments, usually at the air division, numbered Air Force, MAJCOM, or higher level. Output AFSCs may include 26XX, 27XX, 28XX, 51XX, 65XX, 67XX, among others.

#### ADMISSIONS CRITERIA

The educational requirements for admission to the Graduate Systems Management Program are a baccalaureate degree, preferably in business administration, economics, the physical sciences, engineering, or a degree from a service academy. The undergraduate grade point average (GPA) should be 2.50 (on a 4.00 scale), or above. As a minimum, the officer or civilian must have completed college calculus with a grade of C or higher. Applicants must complete either the Graduate Management Admissions Test (GMAT) or the aptitude test of the Graduate Record Examination (GRE), preferably the former, before a letter of eligibility will be issued. The academic eligibility of each student is based on a review of the student's academic credentials by the AFIT Directorate of Admissions (AFIT/RR) and the School of Systems and Logistics.

#### PROGRAMS IN THE AFIT SCHOOL OF SYSTEMS AND LOGISTICS

The School of Systems and Logistics offers three fully accredited programs leading to award of the Master of Science Degree. These are:

Graduate Logistics Management, with majors in:

Logistics Management

Acquisition Logistics Management

Contracting and Acquisition Management

International Logistics Management

Maintenance Management

Transportation Management

Graduate Systems Management, with majors in:

Systems Management

Cost Analysis

R&D Management

Graduate Engineering Management

**PROFESSIONAL CONTINUING EDUCATION**

The Professional Continuing Education Program offers 50 courses, ranging in length from one to six weeks, to approximately 5,000 students annually in residence at Wright-Patterson AFB. Subjects covered include the respective management areas of logistics such as acquisition, contract administration, cost and price analysis, maintenance, and provisioning. In addition to the resident programs, the school provides seminar and on-site courses.

**LIVING AT WRIGHT-PATTERSON AFB**

The services and conveniences of a large, well-organized Air Force Base will make living on Wright-Patterson most enjoyable. Twenty-two hundred government quarters, consisting of two, three, four, and five bedroom apartments, are available within a 10 minute drive from AFIT. Mobile home lots on Government property are also available. The VOQ and BOQ are located only a few blocks from the Officer's Club. There are also many houses and apartments for purchase or rent for those who do not live on base. A USAF Medical Center, including a 310-bed hospital, provides for the

medical needs of the students and their families. A large Base Exchange and Commissary are available. Two golf courses, indoor and outdoor swimming pools, and three gyms are among the base recreation facilities. A motion picture theater, automotive, ceramic, photographic, and woodworking hobby shops, indoor and outdoor tennis courts, bowling alleys, riding stables, and hunting and fishing areas are also available. Wright-Patterson AFB is situated adjacent to Dayton, Ohio, in a metropolitan area of 852,000 people.

#### INFORMATION ON APPLICATION PROCEDURES

##### AIR FORCE OFFICERS

SEE - Base Education Offices

Air Force Manual 50-5

(Chapter 5, Section A-AFIT)

Air Force Regulation 53-11

AFIT Catalog

##### AIR FORCE CIVILIANS (GS-11 or ABOVE)

SEE - AFR 40-411

AFR 40-418

Submit a letter of request for academic evaluation to local Civilian Training Office.

##### ARMY OFFICERS

SEE - Army Regulation 600-101

##### NAVY OFFICERS

Submit Officer Preference and Personal Information Card (NPERS 1301/1)

Contact AFIT/RRE for Additional Information on Admissions - AUTOVON 785-6231  
Contact AFIT/LSY for Additional Information on Program Content - AUTOVON 785-5023/  
5096